What Role Do Medical Schools Play in Shaping a Humanistic Physician?
The Intersection between Climate and Perception

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In order to produce a physician workforce capable of serving a diverse population, medical schools seek to educate their students on professional values, including a humanistic approach to medicine and a willingness to accept and treat all patients. However, while the values and attitudes that students bring with them to medical school undoubtedly play a role in their future professionalism (McGaghie, 1990), evidence suggests that experiences during medical school also matter. For example, informal interactions with diverse peers in medical school have been shown to be positively related to positive attitudes towards diversity (Guiton, Chang & Wilkerson, 2007) while other studies have shown a consistent decline in empathy as medical students progress through their career (Hojat et al, 2009). Clearly, the experiences that occur to medical students while in school can be associated with future outcomes, both positive and negative. However, certain aspects of the institutional climate may help or hinder these experiences. The purpose of this study is to examine in more detail how medical school climate is related to professional outcomes in future physicians.

We believe that what happens as students complete their medical education curriculum is an understudied area that merits exploration. This study explores the relationships between students' entry characteristics and their experiences during medical school with important personal and professional outcomes related to the humanistic practice of medicine. Using longitudinal survey data gathered at two U.S. medical schools, we examine how these input characteristics and experiences during medical school relate to student perceptions of diversity in medicine and universal health care. These attitudes and views have an important relationship with humanistic clinical outcomes, as they suggest that these future physicians respect diverse others and are willing to serve all patients, regardless of their ability to pay.

Theoretical framework

Historically, research on campus climate has occurred at undergraduate institutions. While different scholars have defined climate in different ways over the years, a framework first developed by Hurtado, Milem, Clayton-Pedersen, and Allen (1998, 1999) has become the most widely cited campus climate framework in the higher education scholarship. In this framework, the authors conceptualize the campus racial climate as being comprised of four interrelated dimensions: an institution's historical legacy of inclusion or exclusion, compositional diversity, psychological/perceptual impressions of inclusion, and behavioral interaction across communities of difference. Milem and colleagues have extended the framework to include a fifth dimension, the organizational/structural dimension of climate, which represents organizational structures and policies that affect campus diversity (Milem, Dey, and White, 2004; Milem, Chang & antonio, 2005). In this paper, we apply this theoretical framework to a medical school setting.

The historical legacy of inclusion or exclusion represents the historical vestiges of segregated schools and colleges, which continue to affect the climate for racial/ethnic diversity on college campuses (Hurtado, et al., 1998, 1999). It is important to note that most predominantly White colleges and universities, including medical schools, have a much longer history of exclusion than they do of inclusion and that this history continues to shape racial dynamics on our campuses. We find evidence of this in the resistance to desegregation in some communities and campus settings, in the maintenance of policies that serve a homogeneous population on predominantly White campuses, and in the prevalence of attitudes and behaviors that impede or prevent interaction across racial/ethnic communities. One product of this history of exclusion is the fact that, on many campuses, benefits are sustained for particular groups that

go unrecognized and often work to the detriment of groups that have been historically excluded by the institution.

Compositional diversity describes the numerical and proportional representation of various racial/ethnic groups on a campus. Institutional programs and policies that increase the compositional diversity of a campus play an important symbolic role by communicating that diversity is a priority for the campus and its leaders. Not surprisingly, Hurtado et al (1998, 1999) argue that compositional diversity is the one dimension of the climate that most campus leaders think about when they consider creating programs and initiatives targeted at improving the climate. However, there is also a tendency for institutional leaders and policy makers to focus *only* on this dimension. Compositional diversity is a means toward other important educational ends, not the end in and of itself.

Hurtado and colleagues describe the psychological dimension of campus climate as views held by individuals about intergroup relations and institutional responses to diversity, perceptions of discrimination or racial conflict, and attitudes held toward individuals from different racial/ethnic backgrounds. Empirical evidence clearly demonstrates that racially and ethnically diverse administrators, students, and faculty are likely to view the campus climate in dramatically different ways. Hurtado et al. (1998, 1999) assert that who people are and where they are positioned in an institution affect the ways in which they experience and view the institution, its mission, and its climate. It is vital that campus leaders neither dismiss nor underestimate the significance of these perceptual differences. Moreover, these perceptions are products of the environment, and they influence the decisions that people make about their future interactions in the environment as well as the outcomes that result from these interactions (Astin, 1968; Berger & Milem, 1999; Milem & Berger, 1997; Tierney, 1987).

The behavioral dimension of campus climate comprises the status of social interaction on the campus, the nature of interactions between and among individuals from different racial/ethnic backgrounds, and the quality of inter-group relations (Hurtado, et al., 1998, 1999). A commonly held view is that campus race relations are poor and that segregation has increased on college campuses—usually as the result of students of color isolating themselves from the rest of the campus. However, the empirical research that examines campus interactions by racial/ethnic group demonstrates a very different scenario. These studies reveal that students of color are much more likely than white students to report that they interact across racial/ethnic groups. In addition, research indicates that students from different racial/ethnic groups view same-group interactions differently. For example, Loo and Rolison (1986) found that White students viewed ethnic group clustering as an example of racial segregation or separation, whereas students of color viewed this clustering as a means for finding cultural support within a larger environment they felt was unsupportive. At the same time, the absence of interracial contact does impact students' views toward others, their support for campus diversity initiatives, and their development of key educational outcomes (Hurtado et al., 1998, 1999). Clearly, same-group and inter-group contact need not be mutually exclusive, and what matters in this contact is the *quality* of interaction. Students who have the opportunity to engage diverse peers in regular, structured interactions are more likely to show greater growth on a number of critical educational outcomes.

While Hurtado and colleagues argue that the historical legacy of exclusion at higher education institutions has a significant impact on the prevailing climate that influences policies and practices at the institution, they do not fully elaborate on this important idea (Hurtado, 1992; Hurtado et al., 1998, 1999). To address this perceived shortcoming, Milem, Dey, and White

(2004) and Milem, Chang, and antonio (2005) argue that a "fifth dimension" of climate is important to consider and serves as an important source of influence in shaping the campus climate. Specifically, this dimension represents the organizational and structural aspects of colleges and the ways in which benefits for some groups become embedded into these structures and organizational processes. Areas where the organizational/structural dimension of climate are reflected include the curriculum; campus decision-making practices related to budget allocations, reward structures, hiring practices, admissions practices, and tenure decisions; and other important structures and processes that guide the day-to-day "business" of our campuses.

These five dimensions of climate are not discrete. They influence each other and work together to comprise the overall climate of an institution. For example, an institution's historical legacy of exclusion can have an adverse effect on its ability to try to become more compositionally diverse. Low levels of compositional diversity can lead to students of color being treated as tokens on campus. Perceptions by students of a hostile campus climate can make them unwilling to engage with each other across communities of difference. As we apply these dimensions to this study of medical school climate, we pay particular attention to the psychological/perceptual, behavioral, and organizational dimensions of climate. Students' perceptions of the campus climate, their interactions with diverse others and their views of organizational policies are inextricably connected with one another and we explore how these factors are associated with attitudes about diversity and a desire to provide health care for all.

Literature Review

We focus on experiences in medical school as they relate to these different dimensions of campus climate. Past research suggests that many students change their perceptions, values and attitudes between the time they enroll in medical school and the time they begin their residencies (Wayne et al, 2011; Hojat et al, 2009; Guiton, Chang & Wilkerson, 2007). These changes may be facilitated by their interactions with each other, and as they interact with the policies and structures of a particular institution. Based upon earlier studies of college impact and the campus climate for diversity, we assume that positive perceptions of campus climate and learning environments benefit the future physician workforce, as this helps to prepare them not only to treat patients who are ethnically and racially diverse, but also encourages the development of important skills related to humanistic professional practices.

These humanistic practices, values and beliefs play an important role in medicine. Most commonly associated with professionalism, humanism is often portrayed as those values and attitudes integral to the ethical practice of medicine, including compassion, respect and empathy for all patients, regardless of cultural or ethnic background (Swick, 2007; Gold & Gold, 2006). A physician's ability to connect with patients can lead to better communication, fewer incidents of malpractice and more patient compliance (Gold & Gold, 2006). Stronger relationships with patients may also help prevent burnout and contribute to career satisfaction (Bardes, 2006). Humanism is a professional virtue that allows physicians to be healers, capable of forming trusting, nurturing relationships with their patients (Swick, 2007).

In addition, changing trends in health care necessitate more physicians who intend on practicing in people-oriented specialties. Recent legislation expands health-care coverage to

millions of Americans who are currently uninsured. One study estimates that the United States will need 159,000 additional physicians by 2025. The demand is especially great for primary care physicians in underserved areas (Krupa, 2010). Not only do medical schools need to be concerned with admitting students who hold humanistic beliefs, they must also be sure that they are providing a climate which nurtures and supports these values throughout their medical education.

One way medical educators seek to do this is through lessons designed to increase the cultural competence of their students. In 2002, the Institute of Medicine recommended training in cross-cultural communication for all medical students as a way to decrease health disparities in society (Smedley, Stith & Nelson, 2002). While this training has shown positive outcomes for health care (Kutob, Senf & Harris, 2009; Beach, Cooper, Robinson et al, 2004), other studies have shown that medical students struggle with issues of diversity in medical practice (Dogra & Karnik, 2003). Medical schools themselves are still learning how to integrate cultural competence training into the standard curriculum in ways that do not lead to stereotyping and categorizing (Betancourt & Green, 2010). As curricular content is an important part of a medical student's educational experience, we believe this issue may be associated with attitudes and values towards diversity and other humanistic ideals in the medical profession.

Methodology

Because medical students are not randomly assigned to a particular medical school, an experimental design is impossible. To account for this phenomenon, we applied Astin's Input-Environment-Output (I-E-O) model to the medical school context to properly control for background characteristics and environmental influences (Astin, 1970, 1977, 1991, 1993). In applying the I-E-O model to studies of medical education, *outputs* or *outcomes* refer to the

learning, developmental, and professional talents that medical educators seek to develop in medical students. Astin asserts that in order to determine the impact of a particular program or educational activity, we must account for more than simply the outputs or outcomes of an educational program. Instead, outputs must always be considered in the context of the educational *inputs* of the institution. In the instance of medical education, these *student inputs* or *entry characteristics* are comprised of the experiences or attributes students have at the time they enter medical school, before they ever set foot on a medical school campus. These *entry characteristics* must be considered in studies of medical education because of the important role that they play in influencing student outcomes. The third type of measure that must be included assesses different aspects of the medical school *environment*. These measures include assessments of the medical school environment and students' experiences while in medical school, including courses, programs, contact with faculty, engagement with peers, volunteer activities, and other curricular and co-curricular activities. Environmental measures are most important to medical educators because the medical school environment is the area over which they have the most control. In essence, the environment represents all of the things that medical educators do to prepare their students to be successful as physicians.

Research sites

Our research relies on longitudinal survey data completed by medical students at two U.S. medical schools in the Midwest ("Evergreen University") and Southwest ("Ironwood University"). Both schools are public institutions, although Evergreen University is a more selective institution and admits students from across the country, while Ironwood's student body is composed primarily of in-state residents. In addition, both medical schools have low levels of

compositional diversity within the student body, and admit students from higher income levels than the national average (see Table 1).

Data sources and sample

The first survey was distributed to entering medical students and collected baseline information about students' backgrounds and attitudes towards various social and medical issues. In the spring of 2010, all enrolled students were invited to complete a second survey which collected data related to dimensions of campus climate. Students were also asked their opinions on various social issues.

Only students who completed both the baseline survey and the later campus climate survey were included in this analysis. The final sample consisted of 231 students, 150 of whom were from Ironwood University (response rate = 67%) and 81 from the Evergreen University (response rate=48%).

Table 1: *Institutional characteristics & demographics*

	Evergreen University	Ironwood University
Classification	Public	Public
Class Size	170	115
Male	54.0%	43.0%
Female	46.0%	57.0%
African American / Black	3.0%	1.8%
American Indian/Native American / Alaskan Native	1.8%	0.9%
Asian American / Pacific Islander	30.5%	19.3%
Hispanic / Latino	4.3%	11.0%
White / Caucasian	61.0%	74.3%
Other	3.0%	2.8%
Income level: Less than $49,999	9.6%	13.1%
Income level: $50,000-$99,000	21.6%	36.3%
Income level: $100,000-$174,999	37.6%	27.2%
Income level: $175,000 and over	31.2%	23.2%

Women comprised 53% of the final sample and White students represented 70%.

Asian/Pacific American students were the second largest racial/ethnic group at 25%, followed by

Latinos (7.4%), African Americans (1.3%) and Native Americans (0.4%). The students in our

sample tended to come from high socioeconomic backgrounds. Less than 10% of mothers and

11% of fathers have a high school diploma or lower, while 43% of mothers and 63% of father's

possess a master's or higher degree. In addition, 61% of students in our sample report an annual

household income of $100,000 or higher.

Data analysis

We conducted data analysis in two stages. First, we created several latent constructs using exploratory factor analysis with varimax rotation (see Appendix 1). In the second step of our data analysis, we combined variables into blocks that separated individual traits and pre-medical school characteristics from those experiences that took place in medical school. These blocks were then entered into an OLS hierarchical regression model.

Variables

As shown in Figure 1, we define student inputs as individual traits such as gender, race/ethnicity and socioeconomic status (SES). In this study, the SES variable is the sum of parental education levels with family household income levels, which creates a scale that ranges from 4 to 22 (*M*=16.23, *SD*=4.13). We used a dummy variable to indicate whether or not each individual was an Asian/Pacific American, or a student identified by the Association of American Medical Colleges as underrepresented in medicine (URiM—African-American, Latino, or Native American) to compare to Whites (the omitted category). Because we did not have sufficient representation of URiM students in our sample, we were forced to aggregate them into one group. While we recognize this as a limitation in our study, it is an important finding in and of itself indicating very low levels of compositional diversity in the medical school classes at these two institutions. An institutional dummy variable was also created so we could examine any institutional effects present in our models.

In addition, we also control for behaviors, attitudes and values already in place at the beginning of medical school using the latent constructs created via factor analysis. The pre-medical school variable called *Cross-racial interactions* is a scale which measures how much

interaction a student has with individuals of a different race/ethnicity before matriculating at the medical school. In addition, we include two pre-tests of the outcome variables measuring attitudes towards diversity efforts and universal healthcare. *Healthcare is a right* is a latent construct that measures the extents to which students believe that everyone should have healthcare, regardless of their ability to pay. *Support for diversity in medicine* is a variable that represents support for recruiting and retaining students and faculty of color at medical schools (see Appendix 1 for specific survey items).

Environmental characteristics are experiences within the context of medical school, and were measured during the follow-up survey. *Cross-racial interaction* indicates students' willingness to engage with diverse others, as it measures their interactions within the context of medical school. The *collaborative learning* construct measures the extent to which students worked with others. A student who scores high in this measure may regularly work in a group setting to solve problems or learn new material. This collaborative approach is especially important in medicine, as a physician is expected to work as a member of an integrated health care team. Students who scored high on the *Engaged diversity in medicine* variable reported discussing the role of race/ethnicity in medicine often, and also reported learning about culture and medicine frequently in the classroom. Those who scored high on *Negative interactions with diverse others* were more likely to report experiencing conflict based on their racial or ethnic identity while in medical school.

Supportive organizational climate measures students' perceptions of a positive campus climate at their medical school, including the belief that the faculty values all students and that organizational traditions are inclusive of all students. Likewise, *Supportive faculty* measures feeling valued by faculty members, and comfortable approaching them with problems.

Perception of inclusive climate indicates a belief that the medical school is a safe and inclusive place for every individual, regardless of race, religion or sexuality.

The outcome variables in this study are: 1) Hostility to diversity efforts; 2) Support for diversity in medicine; 3) The personal view that healthcare is a right. The variable *Hostility to diversity efforts* measures the extent to which students believe that diversity is over-emphasized in the curriculum and in the policies and practices of the organization. It is our belief that such a resistance could indicate that a student is apathetic to learning about diverse others and may be less inclined as a physician to practice in underserved areas, many of which are populated with racial and ethnic minorities. *Support for diversity in medicine* is a post-test measure of the belief that medical schools should work to recruit and retain diverse students and faculty. Likewise, *Healthcare is a right* is another post-test measure of the belief that every individual deserves access to treatment, regardless of ability to pay. The relationships between all variables are shown in Appendix 2.

<div align="center">Results</div>

Hostility to Diversity Efforts

In total, 13 independent variables organized in four blocks were entered into the regression (see Appendix 3). The final model explains 28% of the variance in the *Hostility to Diversity Efforts* construct (R^2 = .284). Because we did not have a pre-test variable to measure hostility towards diversity efforts before medical school, this model explains less of the variance than the other models. In the first block of variables, as we would expect, we see a significant negative relationship between being female and opposing diversity goals in medical schools. Being female remains a negative predictor of these beliefs until medical school experiences are entered into the equation in Block 3. SES is significantly and positively associated with the

dependent variable in Block 1 and remained so through Block 4, indicating that students from higher SES backgrounds are likely to be more hostile to diversity efforts.

While no additional significant relationships are found in Block 2, three significant predictors are present in Block 3. Holding everything else constant, students who reported higher engagement in diversity-related discussions both in and outside the classroom, were also more likely to score highly on the *Hostility to Diversity Efforts* construct. This is a somewhat surprising finding, but may be related to the context in which these discussions took place. While our survey was able to assess the quantitative aspect of these discussions, it lacked helpful information about the nature of these discussions (or the more qualitative aspects of this involvement; see Astin (1984) for a discussion of the qualitative and quantitative nature of involvement). Students who are more prone to oppose efforts to diversify the medical school may also be more likely to discuss their views with close friends and families. They may also be more likely to believe that diversity is overemphasized in the curriculum. There was also a significant negative association between the *Supportive Organizational Climate* and *Hostility to Diversity Efforts*. This indicates that students who feel supported by the larger organizational climate of the medical school are less likely to be hostile to efforts by the medical school to incorporate diversity into the curriculum and co-curriculum. Finally, *Perception of an Inclusive Climate* was positively associated with the construct, suggesting that students who feel the medical school is already supportive of diverse groups also believe there is not a need for policies supporting them on campus.

In the fourth block, the institutional dummy variable was added. After controlling for the institution attended, *Cross-racial interaction* became negatively associated with *Hostility to Diversity Efforts*. This is most likely due to students at Ironwood University reporting

significantly higher cross-racial interactions than Evergreen students (t(223)=-2.70, p<.01), which is why this finding did not emerge until after controlling for institution. This finding, as it relates to Ironwood students, supports previous studies that have found that students who report more interaction with diverse others during medical school are less likely to oppose diversity efforts (Guiton, Chang & Wilkerson, 2007; Hurtado et al, 1998, 1999).

Perceptions of a *Supportive Faculty* also became negatively associated with the independent variable in the fourth block. Students who had weaker relationships with faculty members are more likely to oppose diversifying medical schools. Students at Evergreen University reported, on average, stronger relationships with faculty members (t(221)=4.65, p<.001), which may explain why this variable became significant only after controlling for institution. Finally, attending Ironwood University had a positive and significant association with *Hostility to Diversity Efforts*, even after controlling for background characteristics and medical school experiences.

Support of diversity in medicine

Fourteen variables were entered into this regression, including a pre-test measure of students' views on diversity at the time of their enrollment in medical school (see Appendix 4). This model explains 66% of the variance in the construct ($R^2 = .655$). In the first block, there were no statistically significant predictors of the construct among the entry-level characteristics. However, once we controlled for the pre-test measure and the frequency of interaction with diverse others, being a URiM student became positively associated with the construct. Compared to White students, URiMs were much more likely to endorse diversity in medical schools and the significance of this relationship was seen once the pre-test measures are entered. On the other hand, SES was negatively associated. As expected, the strongest predictor of the outcome was

the pre-test variable, as students appeared to maintain their beliefs on diversity in medicine during their time in medical school. These three variables remained as significant predictors of the outcome variable after controlling for medical school experiences in the third block. *Perception of an Inclusive Climate* was negatively associated with *Support of diversity in medicine* in the third block. In other words, students who viewed the campus climate as being less safe or inclusive were more likely to support efforts to diversify the medical school. In the fourth block, attending Ironwood University was negatively associated with supporting diversity efforts, a finding that is consistent with the first regression model.

View: Healthcare is a right

This model was also comprised of 14 variables, including a pre-test measure of student views on healthcare (see Appendix 5). The final model explained 58% of the variance in the dependent variable (R^2 = .583). Being female was positively associated with this viewpoint in the first block, while SES was negatively associated. However, after controlling for the pre-test measure and cross-racial interactions before medical school, being female ceased to be a significant predictor. This is likely due to the fact that women were more likely than men to endorse this view on the pre-test (r=.131, p<.05). SES remained a negative predictor through the final model. In the third block, feeling supported by faculty members was a significant positive predictor of believing that everyone has a right to healthcare. Unlike the first two models, institutional effects were not found in the fourth block. This may be due to the fact that this third model has less to do with diversity-related issues.

Discussion

Our findings suggest that SES is an important predictor of each of the outcomes in our study. Specifically, students who come from more privileged backgrounds are less likely to support diversity in medicine and equal access to healthcare. While the URiM students in our sample come from significantly lower SES backgrounds (t(220)=3.54, p<.001), in two of our analyses, SES was a stronger predictor of the outcomes than was race/ethnicity. This may be due to the small numbers of URiM students enrolled at each institution.

Moreover, measures of the institutional climate were also predictors of the dependent variables in our analyses, although not always in the direction we might expect. The findings regarding the negative relationship between attending Ironwood University and two of our three outcomes are likely explained by the impact of the external environment represented by the sociohistoric and political contexts in which Ironwood is situated (for a discussion of these contexts, see Dey, 1996, 1997 and Hurtado, Milem, Clayton-Pedersen and Allen, 1998, 1999). In addition, qualitative data gathered as part of a larger mixed methods case study point to incidents of conflict regarding race and ethnicity that may also help to explain this finding.

Our study makes important contributions to the literature on campus climate and the outcomes of diversity in higher education in the way that we apply this framework and the scholarship that comes from it to the study of medical education. Our findings indicate that the campus racial climate first developed by Hurtado et al (1998, 1999) and later modified by Milem, Dey, and White (2004) and Milem, Chang, and antonio (2005) can be used in ways that yield important information from the medical school context. We have also learned some limitations to our approach. While our survey does a good job of capturing different aspects of the campus climate, especially pertaining to the psychological and behavioral dimensions, it is

evident that we need to enhance some of these measures. Specifically, we need to develop more robust assessments of interaction with diverse others that capture the context (or qualitative aspects) of these interactions as they are largely absent from this dataset.

Our study has the potential to inform and improve the practices of medical schools regarding the types of students they admit and the types of experiences they provide to medical students once they are admitted if they are truly committed to the goal of producing doctors who are capable of caring for patients from diverse backgrounds and medically underserved populations. In addition, the way in which cultural differences are discussed (or not discussed) in medical school may be ineffective when we consider that many students are resistant or hostile to diversity efforts at the time that they enter medical school. If these activities are to be effective, they must occur within a learning environment that actively promotes critical thinking and discourages stereotyping based on race, ethnicity or culture (Milem, Dey & White, 2004). Regarding this point, our findings suggest that medical educators should closely examine the extent to which their pedagogical practices and curricular content promote this type of critical thinking within medical schools.

Figure 1: Conceptual model

Pre-Medical School

Demographics

Gender

Race/ ethnicity

SES

Entry-level behaviors, views & perceptions

Cross-racial interactions

Pre-test: Healthcare is a right

Pre-test: Support of diversity

Medical School Experiences

Cross-racial interaction

Collaborative learning

Engaged with diversity in medicine

Hostile/negative interactions

Supportive organizational climate

Faculty support

Perception of inclusive climate

Institution attended

Outcomes related to professional practice

Hostility to diversity efforts

Support for diversity in medicine

View: Healthcare is a right

APPENDIX 1: Factor loadings and alpha scores

Factor and Survey Items	Factor Loading	Internal Consistency (Alpha)
Pretest: Support for diversity in medicine		.905
Producing more physicians of color should be a top priority of this medical school	.880	
Hiring more faculty of color should be a top priority of this medical school	.872	
Medical schools should aggressively recruit more students of color	.828	
Pretest: Healthcare is a right		.727
All patients deserve healthcare regardless of their ability to pay	.781	
Doctors should treat patients who do not have insurance and cannot afford to pay their medical bills	.745	
A national healthcare system is needed in the US	.642	
Cross-racial interaction		.924
Had medical or scientific discussions outside of class/rotations	.820	
Talked about my professional values	.812	
Shared personal feelings and problems	.792	
Shared career aspirations	.781	
Studied or prepared for class or rotations	.768	
Dined or shared a meal	.764	
Talked about inequality in society	.728	
Studied with someone from a different racial/ethnic background than myself	.690	
Had meaningful and honest discussions about race/ethnicity	.689	
Socialized with other medical students from a different racial/ethnic background than myself	.588	

Factor and Survey Items	Factor Loading	Internal Consistency (Alpha)
Collaborative learning		.828
Collaborated with peers/colleagues to solve problems	.885	
Participated in group-work	.862	
Worked with others to learn new material	.727	
Worked with other students from diverse racial/ethnic backgrounds	.523	
Engaged diversity in medicine		.781
Discussed the role of race/ethnicity in medicine on my own time	.865	
Learned about how culture impacts medical practice in the classroom	.807	
Negative interactions with diverse others		.744
Had tense, somewhat hostile interactions	.850	
Felt insulted or threatened based on my race or ethnicity	.815	
Had guarded, cautious interactions	.767	
Supportive organizational climate		.842
Leadership communicates the reasons and philosophies behind important decisions	.847	
Diverse viewpoints are sought out and valued by faculty and administrators	.799	
I feel that, overall, the leadership of my medical school is effective	.794	
My medical school is an effectively managed, well-run organization	.751	
Organizational practices match the mission of my medical school	.723	
All medical students are valued by my medical school	.670	
My medical school demonstrates a commitment to helping me succeed	.624	
Organizational traditions are inclusive of all students	.508	
Faculty and staff are open to new ideas	.494	
My medical school has a history of supporting people like me	.439	

Factor and Survey Items	Factor Loading	Internal Consistency (Alpha)
Supportive Faculty		.890
I am comfortable talking with faculty members about professional issues	.808	
I feel comfortable expressing my opinions	.792	
Faculty and staff are interested in my professional success	.754	
Faculty and staff are interested in my academic success	.753	
Faculty members are open and accessible	.704	
Faculty and staff are interested in my personal wellbeing	.676	
I am comfortable talking with faculty members about personal issues	.665	
I have access to resources at my medical school that promote my academic and professional success	.577	
There are sufficient opportunities at my medical school for students to develop their academic and professional interests	.503	
I have visited faculty members outside of class	.432	
Perception of inclusion/safe climate		.815
My medical school is a safe place to be GLBT	.762	
My medical school is a safe place to express concerns or discontent about racial/ethnic issues without penalties	.730	
My medical school has achieved a positive climate for diversity	.702	
People with religious/spiritual values similar to my own are accepted and respected here	.662	
Gay, lesbian, bisexual, and transgender people are accepted and respected at my medical school	.547	
There are enough resources for groups that promote diversity	.441	

Factor and Survey Items	Factor Loading	Internal Consistency (Alpha)
Hostility to diversity efforts		.831
My medical school is placing too much emphasis on achieving diversity at the expense of enhancing prestige	.787	
One problem with pursuing the goal of diversity is the admission of too many underprepared students	.762	
Too many resources are devoted to promoting diversity	.665	
Diversity efforts lead to the hiring of less qualified faculty and staff	.654	
The curriculum spends too much time addressing race and culture in medicine	.598	
There is too much emphasis on gender and sexual orientation in the curriculum	.441	
Support for diversity in medicine		.912
Medical schools should aggressively recruit more students of color	.886	
Producing more physicians of color should be a top priority of this medical school	.882	
Hiring more faculty of color should be a priority of this medical school	.865	
Healthcare is a right		.695
All patients deserve healthcare regardless of their ability to pay	.705	
Doctors should treat patients who do not have insurance and cannot afford to pay their medical bills	.693	
Physicians have a responsibility for the well being of the larger community	.627	
A national healthcare system is needed in the US	.523	

APPENDIX 2: *Correlations between variables*

	Sex: Female	Race: URiM	Race: Asian/Pacific American	SES	Pre-med: Cross-racial interaction	Pre-med: Support for diversity in medicine	Pre-med: Healthcare is a right	Cross-racial interaction	Coll. Learning	Eng. diversity in med.	Neg. int. with diverse others	Supp. Org. Climate	Supp. faculty	Inclusive climate	Institution: Ironwood U.	Outcome: Hostility to diversity efforts	Outcome: Support for div. in med.	Outcome: Healthcare is a right
Sex: Female	1.000	0.074	0.069	-0.040	0.115	.178**	.131*	0.068	0.079	-0.080	-0.040	0.052	0.010	-0.066	0.050	-.164*	.123	.145*
Race: URiM		1.000	-0.107	-.232***	0.096	0.030	0.058	0.094	0.024	-0.105	0.122	-0.059	-0.102	-0.109	0.098	-.192**	.173**	.046
Race: Asian/Pacific American			1.000	0.117	-0.007	0.042	0.064	.227**	0.061	0.005	0.099	0.003	-0.069	0.021	-0.057	.059	-.013	-.004
SES				1.000	-0.045	-0.028	-0.087	-0.038	-0.067	-0.014	-0.003	0.043	0.034	0.068	-.233***	.210**	-.162*	-.163*
Pre-med: Cross-racial interaction					1.000	0.097	0.111	.263***	.213**	-0.013	0.046	-0.010	0.077	-0.003	.178**	-.083	.025	.065
Pre-med: Support for diversity in medicine						1.000	.462***	0.042	-0.130	-0.026	0.086	-0.002	0.002	-.276***	-.198**	-.498***	.707***	.406***
Pre-med: Healthcare is a right							1.000	0.038	-0.096	-0.054	0.056	0.057	.169*	-0.052	-.151*	-.353***	.415***	.728***
Cross-racial interaction								1.000	.355***	0.127	.261***	0.046	0.127	-0.037	0.107	-.105	.067	.043
Coll. Learning									1.000	.246***	-0.057	.320***	.236***	.268***	.255***	.020	-.157*	-.007
Eng. diversity in med.										1.000	-0.067	.154*	0.039	.205**	-.359***	.240***	-.026	-.091
Neg. int. with diverse others											1.000	-.215**	-0.117	-.317***	0.005	.000	.135*	.015
Supp. Org. climate												1.000	.656***	.508***	-.158*	-.131	-.043	.068
Supp. faculty													1.000	.305***	0.044	-.162*	-.080	.254***
Inclusive climate														1.000	0.006	.192**	-.394***	-.104
Institution: Ironwood U.															1.000	.028	-.259***	.001
Outcome: Hostility to diversity efforts																1.000	-.582***	-.458***
Outcome: Support for div. in med.																	1.000	.430***
Outcome: Healthcare is a right																		1.000

Note: * p<.05. **p<.01. ***p<.001.

APPENDIX 3: Results of hierarchical linear regression

Hostility to diversity efforts

Variable	Simple r		Block 1 β		Block 2 β		Block 3 β		Block 4 β	
Sex: Female	-0.164	*	-0.164	*	-0.159	*	-0.108		-0.108	
Race: Underrepresented in Medicine†	-0.192	**	-0.111		-0.109		-0.062		-0.056	
Race: Asian/Pacific American	0.059		0.029		0.030		0.048		0.055	
Socioeconomic status	0.210	**	0.181	*	0.179	*	0.186	**	0.224	**
Pre-med racial interaction scale	-0.083				-0.036		-0.022		-0.032	
Individual score: Cross-racial interaction	-0.105						-0.146		-0.154	*
Individual score: Collaborative learning	0.020						0.081		0.016	
Individual score: Engaged diversity in medicine	0.240	***					0.227	**	0.299	***
Individual score: Negative interactions with diverse others	0.000						0.048		0.051	
Individual score: Supportive organizational climate	-0.131						-0.247	**	-0.151	
Individual score: Supportive faculty	-0.162	*					-0.122		-0.163	*
Individual score: Perception of an inclusive climate	0.192	**					0.275	***	0.249	**
Institution: Ironwood University	0.028								0.188	*
R^2			0.089		0.090		0.263		0.284	
Adjusted R^2			0.070		0.066		0.215		0.232	
R^2 change			0.089	**	0.001		0.173	***	0.020	*

Note: *$p < .05$, **$p < .01$, ***$p < .001$

† Underrepresented in medicine = African American, Latino, Native American

APPENDIX 4: Results of hierarchical linear regression

Support for diversity in medicine

Variable	Simple r		Block 1 β		Block 2 β		Block 3 β		Block 4 β	
Sex: Female	0.123		0.090		-0.034		-0.035		-0.300	
		*								
Race: Underrepresented in Medicine †	0.173	*	0.132		0.140	**	0.105	*	0.098	*
Race: Asian/Pacific American	-0.013		0.019		-0.034		-0.052		-0.056	
Socioeconomic status	-0.162	*	-0.143		-0.108	*	-0.096	*	-0.142	**
Pre-med racial interaction scale	0.025				-0.020		-0.016		-0.002	
						**		**		**
Pre-test: View as 1st year med student	0.707	***			0.747	*	0.681	*	0.653	*
Individual score: Cross-racial Interaction	0.067						0.052		0.061	
Individual score: Collaborative Learning	-0.157	*					-0.030		0.038	
Individual score: Engaged diversity in medicine	-0.026						0.017		-0.054	
Individual score: Negative interactions with diverse others	0.135	*					0.026		0.026	
Individual score: Supportive organizational climate	-0.043						0.070		-0.033	
Individual score: Supportive faculty	-0.080						-0.005		0.044	
								**		
Individual score: Perception of an inclusive climate	-0.394	***					-0.207	*	-0.183	**
Institution: Ironwood University	-0.259	***							-0.207	**
R^2			0.055		0.593		0.631		0.655	
Adjusted R^2			0.035		0.580		0.604		0.627	
						**				
R^2 change			0.055	*	0.538	*	0.038	*	0.023	**

Note: $*p < .05$, $**p < .01$, $***p < .001$

† Underrepresented in Medicine = African American, Latino, Native American

APPENDIX 5: Results of hierarchical linear regression

View: Healthcare is a right

Variable	Simple r		Block 1 β		Block 2 β		Block 3 β		Block 4 β	
Sex: Female	0.145	*	0.146	*	0.059		0.040		0.039	
Race: Underrepresented in Medicine †	0.046		0.003		-0.026		-0.024		-0.024	
Race: Asian/Pacific American	-0.004		0.037		-0.006		0.000		0.000	
Socioeconomic status	-0.163	*	-0.193	**	-0.125	*	-0.117	*	-0.108	*
Pre-med racial interaction scale	0.065				-0.031		-0.062		-0.065	
Pre-test: View as 1st year med student	0.728	***			0.710	***	0.683	***	0.688	***
Individual score: Cross-racial Interaction	0.043						0.004		0.003	
Individual score: Collaborative Learning	-0.007						0.084		0.072	
Individual score: Engaged diversity in medicine	-0.091						-0.056		-0.043	
Individual score: Negative interactions with diverse others	0.015						-0.018		-0.018	
Individual score: Supportive organizational climate	0.068						-0.050		-0.030	
Individual score: Supportive faculty	0.254	***					0.186	**	0.177	**
Individual score: Perception of an inclusive climate	-0.104						-0.103		-0.109	
Institution: Ironwood University	0.001								0.036	
R^2			0.060		0.544		0.582		0.583	
Adjusted R^2			0.040		0.530		0.552		0.551	
R^2 change			0.060	*	0.484	***	0.038	*	0.001	

Note: *$p < .05$, **$p < .01$, ***$p < .001$

† Underrepresented in Medicine = African American, Latino, Native American

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